



CASE REPORTS

Use of a Serosal Patch in Repair of a Duodenal Fistula

Clinical Application of an Experimental Method

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REPORTS BY Jones,^{1,2} Kobold,³ and Wolfman⁴ have recently appeared in the literature describing an experimental method of closing acute or chronic duodenal fistulas in dogs by covering the defect with an unopened loop of jejunum, making in effect a "serosal patch." No clinical cases utilizing this technique were reported by them. We recently applied this method in treating a patient for whom no other solution appeared to give any hope of success.

Report of a Case

A 54-year-old man, an alcoholic, was admitted to hospital 6 September 1964 because of hematemesis and melena. Initial laboratory reports were as follows: Hemoglobin 9.5 gm per 100 ml prothrombin time 85 per cent of normal, total protein 5.3 gm per 100 ml with 3 gm albumin, total bilirubin 1.84 mg and blood ammonia 51 mcg per 100 ml.

The patient remained in satisfactory condition until September 9, when massive bleeding began. A Blakemore-Sengstaken tube was passed and pituitrin was given intravenously, but bleeding continued. That afternoon an emergency end-to-side portacaval shunt through a long subcostal incision

was carried out with extreme difficulty because of an immense abdomen. After completion of the shunt the patient's general condition was satisfactory, so a decision (in retrospect, unwise) was made to do pyloroplasty and vagotomy to decrease the risk of post-shunt ulcer. A standard Heineke-Mikulicz pyloroplasty was done with a one-layer closure of 4-0 silk. Vagotomy was attempted, but because of technical difficulties it could not be completed. Cholecystectomy and liver biopsy had been done before completion of the shunt. The patient required 21 pints of blood before and during operation. Except for a brief period of somnolence on the second postoperative day when the blood ammonia was 260 mcg per 100 ml, he did well until September 13, when *Staphylococcus aureus* was cultured from the middle of the incision around the Penrose drain. On September 14 the lateral aspect of the infected wound was opened. The following day gastric juice was found to be draining around the omentum which could be seen at the level of the skin about the drain site.

As the general condition of the patient appeared unchanged, repair of the fistula was delayed until September 17 while antibiotics and general supportive care were given. On September 14, serum bilirubin was 3.96 mg per 100 ml. On September 16 total protein was 4.8 gm per 100 ml, with albumin 2.44 gm. With a nasogastric tube in place very little fluid drained from the fistula, but in the two days before closure of the fistula, gastric aspirate totaled nearly 7,000 ml.

On September 16, eight days after the first operation, closure of the pyloric fistula by the "serosal patch" technique was carried out (Figures 1 and 2). The infected, eviscerated wound was reopened, and the first loop of small bowel that presented itself (probably distal jejunum) was brought over the colon and sutured over the pyloric defect serosa-to-serosa with interrupted sutures of 4-0 Tevdek.[®] The defect, approximately 3 by 1.5 cm, resulted from partial dehiscence of the pyloro-

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plasty. This communicated with a small subhepatic collection of fluid. After the "serosal patch" was completed, the jejunal loop was found to take such an abrupt turn in the depths of the subhepatic

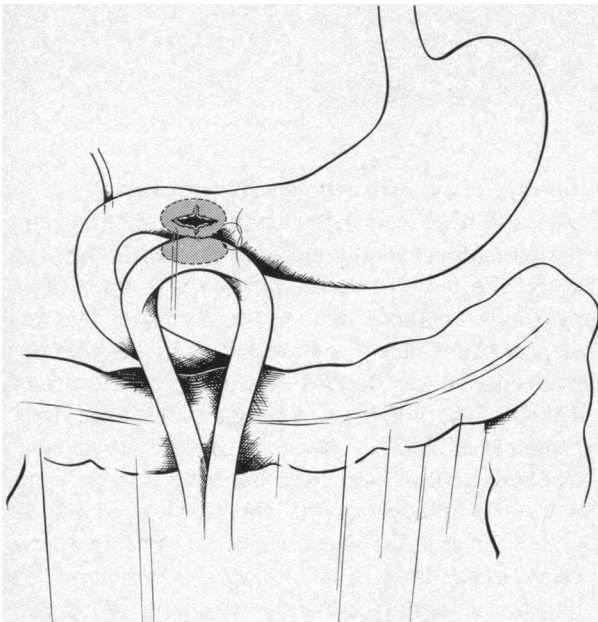


Figure 1.—Diagrammatic representation of an unopened jejunal loop being sutured serosa-to-serosa to close the pyloric fistula resulting from a Heineke-Mikulicz pyloroplasty.

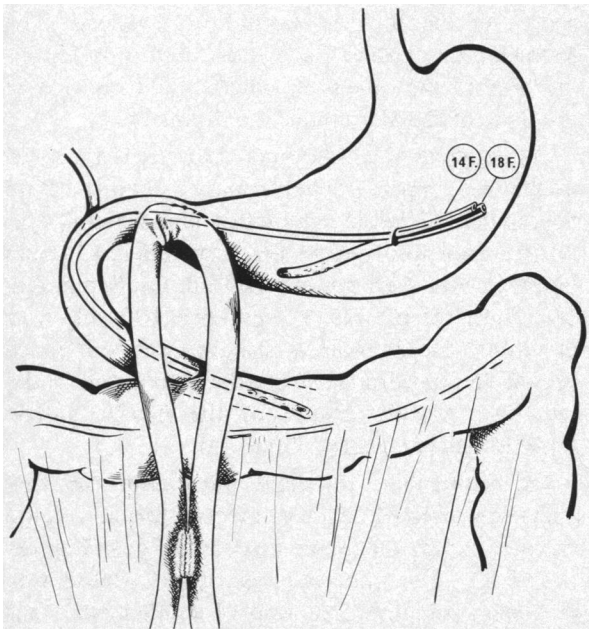


Figure 2.—Operation complete with the pyloric fistula plugged by the "serosal patch." A No. 18 French catheter was used for aspiration of the stomach and a No. 14 French catheter was threaded into the distal duodenum for feeding. A sump drainage tube (not depicted here) was placed near the "patch" in the subhepatic space. An entero-enterostomy was done to prevent obstruction of the loop.

space that obstruction at this point seemed very likely. Therefore, a by-pass entero-enterostomy was done as a safeguard. Through a gastrostomy opening a No. 18 French catheter with many side holes was inserted into the stomach for aspiration, and a No. 14 French catheter was threaded past the pyloric defect into the third portion of the duodenum for suction and later feeding. A sump drain was inserted into the subhepatic space through a separate stab wound to insure adequate drainage.

Drainage of material from the stomach through the gastrostomy tube resumed at the previous incredible rate until the next day when propantheline (Pro-Banthine®) was given intramuscularly and magnesium aluminum hydroxide (Maalox®) was instilled into the stomach. Thereafter, gastric drainage was not unusual, and enterostomy tube feedings were begun September 20. On September 22 limited oral fluids were started, and by September 26 the patient was taking a soft bland diet in six feedings without tube supplements. Serum proteins on September 24 were still very low, with the albumin 2.1 gm per 100 ml and the total 5.1 gm.

The wound, which had been packed open from the fascia out, remained indolent. A moderate amount of serous fluid drained from around the sutures, but there was no indication of recurrence of dehiscence or of suture-line leak. On September 27 the patient was transferred to another hospital for further care. A daily low grade afternoon temperature developed but he continued to eat well and seemed to be slowly improving when he died suddenly on October 7, three weeks after closure of the fistula. A pulmonary embolus was suspected, but autopsy* showed atelectasis and toxic myocarditis as the cause of death. Bilateral subphrenic abscesses, estimated at 200 to 300 ml each, were present but no connection was found between these and the "serosal patch." The area of the pylorus was well healed without local abscess. The portacaval shunt was patent. Unfortunately, no microscopic sections were made of the "serosal patch."

Discussion

Acute and chronic lateral duodenal fistulas have always been extremely difficult surgical problems, with high morbidity and mortality rates, and little tendency to heal spontaneously. In the past, primary closure, excision with end-to-end anasto-

*By Dr. Paul Michael, Monterey.

mosis, gastric resection, or even pancreaticoduodenectomy have been recommended as methods of closure, but with poor results.

Jones¹ reported on a woman who required excision of a 5 cm by 7 cm portion of the wall of the descending duodenum during right colectomy for carcinoma of the colon. Successful repair was effected by retrocolic side-to-side open duodenojejunostomy. This required an open anastomosis, however, with its inherent complications.

Kobold³ and Wolfman⁴ reported a simple serosa-to-serosa closure of experimental duodenal defects in dogs by suturing an intact loop of jejunum over the hole, thereby eliminating the open anastomosis. In their experiments, the serosal surface of the jejunum was gradually covered by duodenal epithelium, the process being complete in four to seven weeks. No anastomotic leaks occurred, and there was no apparent tendency for peptic digestion of the loop.

Jones,² working independently, later carried these experiments even further, in that he created a duodenal defect analogous to a perforated duodenal stump, allowing the leak to continue for 20 hours. Then at a second operation the duodenal defect was closed by the "serosal patch" technique. Again, all dogs survived and no anastomotic leaks occurred. This study in infected animals is especially pertinent to the present case report.

With these excellent studies as a stimulus, the first clinical application of the method awaited only the right patient with the right problem. Certainly in the case herein reported it was inconceivable that primary closure of the duodenal defect could succeed, or that resection with end-to-end anastomosis would fare any better. The presence of infection, the poor general condition and immense size of the patient prohibited a major resection. Of course, in retrospect, the pyloroplasty should not have been done at the time of the original operation, and then no fistula would have occurred.

In spite of the Staphylococcal infection and low serum proteins, the postoperative course suggested that the "serosal patch" effectively sealed the defect. At the time of the sudden death of the patient three weeks later, he was eating a soft diet and had no evidence of recurrent fistula. Autopsy showed death due to massive atelectasis and toxic myocarditis. No evidence of anastomotic leak was found.

Additional cases will have to be accumulated and the long-term results studied, but the method

gives promise of being a very simple solution to an extremely difficult problem.

Summary

The "serosal patch" technique previously used only experimentally was used in a patient who was in poor general condition and an alcoholic, to close a pyloric fistula resulting from the dehiscence of a Heineke-Mikulicz pyloroplasty done at the time of an emergency poracaval shunt for massive bleeding. Partial evisceration had occurred at the site of incision for the first operation and the wound was grossly infected with *Staphylococcus aureus* at the time the "serosal patch" operation was done. The patient died in another hospital three weeks later of toxic myocarditis and massive atelectasis, and at autopsy no evidence of anastomotic leak was found.

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Infectious Mononucleosis

With High Heterophile Titer and Neurological Manifestations

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THE DIAGNOSIS of infectious mononucleosis, although the disease may be strongly suspected, usually is not established clinically, until the supporting laboratory tests are secured. These consist of the characteristic "atypical" lymphocytes (virocytes, Downey cells), the elevated heterophile antibody titer for sheep cells (the pre-

From the Department of Laboratories, St. Joseph Hospital, Burbank. Submitted 12 May 1965.